ATOMIC ENERGY Newsletter

THE FIRST AND ONLY

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Dear Sir:

A new plan for handling atomic energy in Great Britain was submitted to the House of Commons last week in the form of a White Paper, and an order in council. The Paper, which emphasized Britain's very great need for new electrical capacity, and the importance of a large effort by her to obtain economic electrical energy by nuclear means, proposed that responsibility for atomic energy be transferred from the Ministry of Supply to a statutory corporation. Thus, Britain's atomic energy project will now be handled as a public utility administered by a semi-autonomous public corporation. This new organization is to be set up this January 1st; the order in council transferring responsibility from Duncan Sandys (Minister of Supply) to the Lord President of the Council (now Lord Salisbury) accompanied the White Paper. First chairman of its executive board will be Sir Edwin Plowden. The plan for this new organization is based upon a report by a committee set up last April, and headed by Lord Waverley. (At present, two British plants for producing economic electrical energy, with nuclear reactors, have been provided for. One is now being built at Calder Hall, Cumberland, while another is to be constructed some 50-miles from Glasgow, Scotland. Each is to have a capacity of 50,000-kilowatts.)

While Britain approaches atomic industrial power from her angle (as above), the United States also is attempting to accelerate nuclear energy work. This is taking the form, in the U.S., of amendments to the Atomic Energy Act (1946), which will be presented to the next Congress. As now being drafted by the USAEC, the amendments would liberalize the patent system so that private firms would be enabled to obtain exclusive rights to their own work in this field; would enable private concerns to own or rent fissionable material and to own and operate nuclear reactors; and would clarify new developments such as fusion weapons so that proper legal controls might be established.

An attempt is now being made to handle on a uniform basis special uranium producing situations (out of which arise the need for special price allowances), W. J. Bennett, president, Eldorado Mining & Refining, and Atomic Energy of Canada, Ltd. said last fortnight in Toronto. He was referring to special price deals which Eldorado, the government buying agency in Canada of uranium ores, makes with producing mines for their uranium ore output. Mr. Bennett mentioned two conditions under which a special price (higher than the published uranium ore buying price) is paid by Eldorado: First, he said, when a property has a proven tonnage of substantial dimensions, but it is in such a location, and with such a grade that production would not be economic at the regular price; and secondly, when a property plans to produce a high grade mill product but can reach this stage only after large expenditures for plant.....A report on Utex Exploration Co., which became one of the major producers of uranium ores on the Colorado Plateau, has now been made available by the Bureau of Mines, Pittsburgh 13, Pa.

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BUSINESS NEWS...in the nuclear field...

NUCLEAR EXPLOSIVES PROCESSING PLANT CONSTRUCTION CANCELLED: Construction of the projected Spoon River nuclear explosives assembly and processing plant near Macomb, Ill., has now been cancelled. The action was taken by the USAEC following technical developments which will considerably enlarge the output of already existing plants, which turn out the same devices as would have been made in the projected plant. The action cancels some $26 million in construction and engineering expenditures, which had been estimated for this plant. It was also estimated that $4 million in start-up costs would have been incurred, as well as some $3 million per year in net recurring operating costs. Operating contractor of Spoon River was to have been Thompson Products, Inc. Fluor Corp., Ltd., Los Angeles, Calif., were the architect-engineer on th job. Contracts with these concerns are now being cancelled. Payment for the work already accomplished, and costs of contract termination are expected to reach $2 million.

CERTAIN ACTIVITIES CURTAILED AT MOUND LABORATORY: As a result of recent progress in atomic energy research programs, the USAEC has discontinued a portion of the work being done at Mound Laboratory, Miamisburg, Ohio. This reduction in the laboratory's research and development program will result in a reduction of personnel from the present total of 610 to about 500. The level of employment, to be attained in part by transfers and resignations, is expected to continue at Mound, which is operated by Monsanto Chemical as a permanent installation for USAEC research and development work.

WASTED NUCLEAR REACTOR HEAT TO BE UTILIZED: Large quantities of waste heat, developed in the nuclear reactors at Handford Plutonium Works, Richland, Wash., are now to be used for heating buildings, the first such application of nuclear-developed heat in the United States. The system was designed by the Charles T. Main firm of architect-engineers, and engineers of the General Electric Co., contract operators of Hanford for the USAEC. Actually, several buildings will be heated by one system, but about half the heat will go into the main structure housing a production reactor, now under construction.

Operation of the system will be achieved in this manner: Water from the Columbia River is now used for cooling purposes in the Hanford production reactors. Because dissolved mineral matter in this water becomes slightly radioactive in the process, the water from the reactor will be run through a heat exchanger to warm up the water in a secondary piped circuit that will relay the heat to an air conditioning system in the building, while the radioactive water is carried away. (To prevent the movement of contaminated dust particles from the reactor to the working areas, a constant flow of air is maintained across the reactors to the outside. Consequently, no air is reheated and recirculated in the building. Instead, a large volume of air per minute is pumped in from the outside, cleaned, heated and poured into the building. Therefore, to pipe the water direct from the reactor through coils in the floor or walls to warm the building by radiant heat would be impactical because of this large volume of fresh air constantly moving in.) The heating system itself consists of three major elements connected by an appropriate system of piping. There is first, the primary exchanger, which transfers heat from the effluent stream to an intermediate fluid; then the secondary exchangers, which transfer heat from this intermediate fluid to the air; and third, a by-pass exchanger which is arranged to provide adequate heating when the reactor process is shutdown. The by-pass exchanger is supplied with steam from a central station plant when called on to perform. Since the primary purpose of this steam plant is to supply emergency electrical energy to the plant in the event of a power outage, no extra capacity for heating is considered in installing the steam generators. The investment for this heat recovery system is estimated at about $614,000, and an annual operating cost, excluding repairs, at about $2,200. The estimated fuel saving of $59,000 a year would amortize in 7½ years the $44,000 of the initial cost of the heat recovery system that would be additional to the cost of a conventional steam system. A network of piping connects the various process buildings with the primary heat exchanger. This piping is all sub-surface, and is not insulated, as the primary heat source is both abundant enough and at sufficiently low temperature so that losses to the ground will be negligible.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...in the nuclear field...

FROM THE MANUFACTURERS: New model 412 coincidence anti-coincidence analyzer incorporates fixed resolution ranges, which, the manufacturer states, are fixed for the life of the instrument. It is said that this model 412 will not go out of calibration when a tube is changed, or other repairs made to it. Output pulses are negative, enabling most types of commercial scalers to be used with this instrument. Channel deadtime is stated to be less than 10-microseconds.--Radiation Instrument Development Laboratory, Chicago 36, Illinois.

Model L-76 "Radicond" makes use for what is said to be the first time of automatic timing in a portable quartz fiber type meter. The fiber image stops on the scale at the end of the timing interval. The double range timer can be set so that the reading is direct over a wide range of activities. This meter was especially designed to make emergency and field measurements of the contamination of food and water in the simplest possible manner. The instrument will measure from 100-times the accepted Civil Defense emergency levels down to radioactive background. --Landsverk Electrometer Co., Glendale 4, Calif.

New model 183 scaler is for use with Geiger or scintillation counters. The instrument is recommended by the manufacturer for routine sample counting, and features controls to allow operation for a predetermined number of counts or a predetermined length of time. Higginbotham scale of 256 and 2-microsecond resolving time permits counting samples of high activity. Scale selector and "count-o-matic" operation switch of 10, 100, or 1000 times the scaling factor provide the preset count settings. Built-in timer indicates elapsed time to 9999.99-minutes, and internal high voltage supply provides 500 to 2500 volts for Geiger or scintillation detectors. Single switch operates electrical reset of register, timer, and interpolation lamps, or the unit may be obtained without the timer and with manual reset controls.--Nuclear Instrument & Chemical Corp., Chicago 10, Ill.

Model SC-14 plug-in decascale is a direct reading electronic counter said to be capable of operating at speeds up to 75,000 counts-per-second and which can resolve individual pulses separated by as little as 5-microseconds. The decascale has a five-tube decade scaling unit with a self-contained ten-light neon indicator. It contains four conventional scales-of-two with additional circuit connections which cause the system to deliver an output pulse and to reset after ten input pulses have been received. The output pulse may be applied to the input of the following decascale, or to other devices. Input pulse range is from 75-to 100-volts negative, with a rise time of one microsecond or less. Output pulses are 100-volts negative, at count of 10, with 100-volt positive pulses available at counts of 2, 4, 6 and 10 for special uses.--Tracerlab, Inc., Boston 10, Mass.

NOTES: Using a beta ray source is a new instrument for determining hydrogen in hydrocarbons, developed by Standard Oil Co. (Indiana) and licensed for manufacture by Central Scientific Co., Chicago. The test time for the instrument, called the Cenco Beta Ray H/C Meter, is five minutes, compared to four or five hours for combustion methods. An accuracy of 100% is claimed by Cenco for the instrument. Operating principle of the meter is that the number of electrons determines absorption of beta particles. Hydrogen, with only one electron, has twice the beta absorption per unit weight as carbon with six electrons. A null balance system is employed in the instrument: beta ray absorption of a 10-ml. sample, held in a fixed volume container, is balanced against that of a movable wedge, functioning as a variable absorber. In the Cenco meter, the beta ray source radiates equally in two directions, one to the fixed absorber, the other to the wedge. An ionization chamber picks up electric charges going to the fixed absorber, whereas another chamber collects charges going to the wedge. The density of the liquid sample is measured simultaneously by a hydrometer. Absorption data, together with the specific gravity of the sample, permit the calculation of the hydrogen, or H/C ratio. The beta ray absorption tells the total number of electrons in the sample, while the specific gravity tells the total number of neutrons plus protons in the sample. The operator is shielded from the radiation source by a thick copper block holding the radiation source, as well as by shielding built into the walls of the ionization chamber. The design of the instrument is such that the radioactive source is not readily accessible; it can only be removed with considerable dismantling of the apparatus.

THE ROAD AHEAD: Condensation of a talk by that title delivered by Thomas E. Murray, USAEC Commissioner, at Duquesne University, November 11th, 1953.

You have given me today the most difficult of all tasks--that of looking into the future. I am neither scientist nor philosopher, so, in looking ahead with you, I am going to stray from the theme of our symposium "Philosophy & Science in an Age of Power".

The first business of this generation is to see to the survival of science and philosophy, yes, even of all civilization.

This matter of survival has been especially on my mind since a year ago when I participated in our thermonuclear testing in the far Pacific. From that time on I knew that man's survival must be planned for and worked for and not just lightly taken for granted as in the past. Within a few months after the Eniwetok test, in a speech at Manhattan College, I tried to put clearly on the public record this fact by stating, "Had you been with me last Fall, at our Testing Station at Eniwetok, you would have no doubt that mankind has within the range of its grasp the means to exterminate the human race".

And as each atomic test unfolds new and more terrifying secrets, the significance of this April statement becomes clearer and clearer.

Now during my early days on the Commission I heard (and from very knowledgeable scientists) that it was probably impossible to bring about a thermonuclear explosion. And scientists have known for many years the theory that the fusion of light elements under certain conditions should release large quantities of energy. But there was great doubt as to whether the theory could ever be proven. There was no pressure to develop a device employing such a theory. We were comfortably ahead of the Soviet Union in fission weapons--why chase after the near impossible? However, stung out of our complacency by the Russian test in 1949, and the unexpected speed of the U.S.S.R.'s atomic developments, our Government cast about for a radical initiative that would restore the United States' margin of atomic leadership. It was then that Lewis L. Strauss, then a Commissioner (now chairman) of the USAEC proposed that we attempt the development of the so-called hydrogen bomb.

But the years of the atomic age raced swiftly by.

And now the times cry out urgently for a step forward not in technology--not in scientific knowledge--but in world politics. For while we have failed to preserve safety in exclusiveness, we may yet find safety in some form of international action. As President Eisenhower said last April 16th, "We would welcome and enter into the most solemn agreements. These would include international control of atomic energy to promote its use for peaceful purposes only, and to insure the prohibition of atomic weapons".

I therefore now think that control of atomic weapons would be more attainable if the United States again gets used to some companionship on this dangerous atomic road we are walking.

Remember, in the face of the U.S.S.R. rebuff to the unprecedented generosity of America's 1946 atomic energy control proposals, the U.S. has retained almost unlimited exclusiveness and freedom of action in the field of atomic energy and atomic weapons. To slow down the U.S.S.R. weapons program, we have tried to keep to a minimum the export of classified atomic energy information from this country. But events in the U.S.S.R., which it was designed to defer or prevent, have occurred, and therefore this policy, it seems to me, needs modification.

For these reasons, a new attempt should be made to try to find a way of working more closely with our World War II atomic partners--the U.K., Canada, and then with other friendly nations.

We must also raise our hopes. I cannot condone the fatalism which has become fashionable in high places--a prideful assuming to know the future and know that it is all black. A force is here which can destroy us all. But such inevitable destruction of civilization means death to Sovietism as well as to democracy. The United States must get this cold realization first, and in the very act of doing so may bring that same realization into the Soviet mind. And this should give the Kremlin cause to reconsider what atomic war means: the extinction, together with capitalism, in a man-made Abomination of Desolation.

ATOMIC PATENT DIGEST...latest U.S. grants in the nuclear field...

High energy radiation counter. A Geiger-Muller type counter comprising (in part) a gas-tight tubular envelope of dielectric material containing an ionizable gas, and electrodes within this envelope, one being a cathode and the other an anode. An operating circuit for this device consists essentially of a source of potential connected directly between the two electrodes, with the electrodes and the wall of the envelope being part of the circuit; a counting device is coupled between these electrodes. U. S. Pat. No. 2,657,315 issued Oct. 27th, 1953; assigned to International Standard Electric Corporation, New York, N.Y. (Inventor: Ladislas Goldstein.)

Method and apparatus for focusing charged particles. Electrostatic focusing means, in an electromagnetic separator device comprising the combination of a transmitter and a receiver, and having means establishing a magnetic field constraining ions emitted from this transmitter to traverse arcuate paths. Includes (in part) several parallel spaced electrodes lying in planes parallel to these ion traverses. Electrical supply means apply electrical potentials to these electrodes whereby equipotential refracting surfaces are established normal to the plane of and in the path of these ion traverses whereby the ions are influenced to converge at foci. U.S. Pat. No. 2,658,150 issued Nov. 3rd, 1953; assigned to United States of America (USAEC).

Pump for electrically conducting liquids. Comprises (in part) the combination of a tube of glass, an elongated core comprising laminated iron disks, and means for mounting the core within the tube and along the axis to form a partitionless annulus between the core and the inner wall of the tube. A polyphase electromagnet surrounds the tube to produce in the annulus a magnetic field rotating about the axis of the tube. A liquid inlet is at one end of the tube, and a peripheral liquid outlet is at the other end of the tube. In operation, an electrically conducting liquid is admitted through the inlet, rotated in the annulus by the action of the rotating field, and forced out at the periphery by centrifugal force. U. S. Pat. No. 2,658,452 issued Nov. 10th, 1953; assigned to United States of America (USAEC).

Process for separating and purifying the mono- and di-alkyl forms of a phosphoric acid wherein the alkyl substituent radical contains less than nine carbon atoms. The steps comprise equilibrating such phosphoric acids with a first phase exhibiting aqueous characteristics, and with a second phase. The phases are then separated, and washed, thereby purifying the primary constituent extracted. U. S. Pat. No. 2,658,909 issued Nov. 10th, 1953; assigned to United States of America (USAEC).

Process of welding beryllium-base metals. Comprises welding these metals using a shield gas consisting of from 95 to 99.5% by volume of a noble gas, and from 5 to 0.5% by volume of a fluorochlorohydrocarbon selected from the group consisting of fluorochloromethanes and fluorochloroethanes. U. S. Pat. No. 2,658,981 issued Nov. 10th, 1953; assigned to United States of America (USAEC).

Method of compensating for the effects produced by variations in the operating characteristics of elements used in a well surveying sub-surface unit, this unit having a system of elements which employ a radiation detector of the scintillation counter type. Comprises (in part) subjecting the scintillation counter to radiation emanating from the wall of the well, and simultaneously monitoring one of the parameters which produces only an effect that is to be compensated. The output signals from the monitor are then utilized to vary the operating characteristics of at least one element in the scintillation counter system whereby the output signals from the scintillation counter system will be representative of the intensity of the radiation emanating from the wall of the well. U. S. Pat. No. 2,659,011 issued Nov. 10th, 1953.

Sincerely,

The Staff,
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